



Lymphocytic Disorder

The evidence of disease especially infectious disease can be observed by finding abnormal concentration of lymphocytes and or reactive lymphocytes on a peripheral blood smear. Most disorders affecting lymphocytes are acquired and are featured by a reactive lymphocytosis. Some acquired disorders result in lymphocytopenia that can compromise the function of the immune system.

Lymphocytosis

It was mean an increase in lymphocytes occur in adults when the absolute number of lymphocytes exceed $4.8 \times 10^9/L$. A reactive lymphocytosis is observed during many **bacterial infections** for example:

1- During pertussis (whooping cough) **2-** Rickettsiosis **3-** Tuberculosis **4-** Brucellosis

As well as during certain **viral infections** such as:

1- Cytomegalovirus (CMV) infections

2- Hepatitis

3- Rubella

Lymphocytosis is usually a self-limiting, reactive process that occurs in response to an infection or inflammatory condition, both T and B lymphocytes commonly are affected but their function remain normal. once lymphocytes are stimulated by an infection or inflammatory condition, they enter various states of activation resulting in a morphologically heterogeneous population of cells on stained blood smear.

Lymphocytopenia

Some disorders are associated with a lymphocytopenia which occur in adults when the absolute lymphocyte count is less than $1.0 \times 10^9/L$. When the lymphocyte count is decreased there could be an impaired ability to mount an immune response resulting in immunodeficiency. This disorder result from decreased production or increased destruction of lymphocytes.

One of the condition associated with lymphocytopenia is corticosteroid therapy which causes a sharp drop in circulating lymphocytes within 4 hours, this decreased is caused by sequestration of lymphocytes in the bone marrow. values return to normal within 12-24 hours after cessation of therapy.

Immune deficiency disorders

These disorders features by impaired function of one or more of the component of the immune system T,B,NK cell and lymphocytes, acquired immune deficiency syndrome (AIDS) is an infectious disorder featured by lymphocytopenia. this disease is caused by infection with retrovirus. AIDS is featured by the occurrence of repeated infections with



multiple opportunistic organisms and an increase in malignancies in individuals infected with HIV

Patients infected with HIV progress through **3** recognized stages:

1-An asymptomatic carrier stage

2-An AIDS related complex stage (mild symptomatic stage)

3-Symptomatic AIDS with one of the disease defining clinical conditions.

Pathophysiology

Etiologic agent of AIDS has been identified as the retrovirus HIV-1, this virus selectively infects helper T lymphocytes by binding to the lymphocyte receptors causing rapid, selective depletion of this lymphocyte subset.

Laboratory findings

Multiple hematologic abnormalities are found in AIDS including leukopenia, lymphocytopenia, anemia. Positive serologic HIV antibody test, positive HIV nucleic acid test. macrocytosis occurs in up to 70% of patients.

primary lymphoid organs (central) : 1-bone marrow 2-thymus

secondary lymphoid organs (peripheral) : 1-lymph node 2-spleen 3-tonsils.



PRIMARY LYMPHOID ORGANS VERSUS SECONDARY LYMPHOID ORGANS

PRIMARY LYMPHOID ORGANS	SECONDARY LYMPHOID ORGANS
Organs of the immune system where lymphocytes are formed and mature	Organs of the immune system which maintain mature naive lymphocytes and initiate an adaptive immune response
Allow lymphoid stem cells to proliferate, differentiate, and mature	Allow lymphoid cells to become functional
Contain either T cells or B cells	Contain both T cells and B cells
Have no contact with antigens	Have contact with antigens
Undergo atrophy with age	Increase size with age

Visit www.PEDIAA.com

References:

- 1-Laposata, M. (2014). *Laboratory Medicine Diagnosis of Disease in Clinical Laboratory* 2/E. McGraw-Hill Education.
- 2- Hoffbrand AV, Steensma DP. Hoffbrand's essential haematology. John Wiley and Sons; 2019 Dec 31.